

METHOD AND APPARATUS FOR TRANSACTION TRACKING
OVER A COMPUTER NETWORK

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CROSS-REFERENCE TO RELATED APPLICATIONS

The present application claims the priority of U.S.
Provisional Application No. 60/202,221 entitled "Method and
Apparatus for Transaction Tracking over a Computer Network"
10 filed May 5, 2000, the contents of which are fully
incorporated by reference herein.

FIELD OF THE INVENTION

The present application relates to the field of digital
15 advertising via computer networks, and more particularly, to a
method and system for monitoring and recording transactions of
a user who is redirected to a transaction site after selecting
an advertisement, e.g., an ad banner, at a content site.

20 BACKGROUND OF THE INVENTION

With the growth and commercialization of global computer
networks, such as, for example, the Internet, delivery of
advertisements over a computer network has become commonplace.
Much of the content on the Internet is located on the World
25 Wide Web, the often graphical portion of the Internet, which
has become one of the most popular venue for accessing
information. A user visiting a content site, which is a node
on the computer network, and viewing an advertisement, known
in the industry as a "creative," is often invited to select
30 the advertisement, e.g., by clicking on the creative such as
an ad banner. Many creatives contain click-thru code in
addition to the advertisement comprised of graphic and/or
text. Click-thru code automatically redirects the user to
another network site when the user clicks on the creative.
35 Thus, upon selecting a particular advertisement, the user is

typically redirected to another network site associated with the particular advertisement.

5 To assess effectiveness of an advertisement or a campaign, it is often desirable to gather some information about the advertisement viewed and/or selected by a particular user. In conventional systems, the number of times the particular user views a particular advertisement is typically
10 tracked. The number of times the particular user selects the particular advertisement is also typically tracked in the conventional systems.

For more thorough assessment of effectiveness of an advertisement or a campaign, however, it is desirable to
15 monitor and track not only the number of times each advertisement has been viewed or selected by a user, but also the transactions of the user while visiting the redirected network site. For example, purchases made by the user while at the redirected network site may be important for compiling
20 user statistics such as spending habits, as well as for measuring ad effectiveness.

Further, advertising rates charged by a content site to advertisers, in many instances, are at least partly based on the effectiveness of the advertisements on the content site.
25 Thus, any monitoring or tracking of user transactions at the network site being monitored should ensure that the user has been redirected to the network site, at least initially, by the advertisements viewed and selected at the content site.

Therefore, it is desirable for a content site to monitor
30 and/or track transactions by a user redirected from the content site to the network site.

SUMMARY OF THE INVENTION

One embodiment of the present invention is a computer
35 network. The computer network includes a user node, which

provides a request to perform a transaction. The computer network also includes a transaction node. The transaction node receives the request to perform the transaction, performs the transaction in response to the request and provides a transaction confirmation to the user node. The transaction confirmation includes a command to record the transaction. The user node provides a request to record the transaction in response to the command to record the transaction. In addition, the computer network includes a monitor node. The monitor node receives the request to record the transaction provided by the user node and records the transaction in response to the request.

15 In another embodiment of the present invention, the computer network includes a content node. The content node provides a content having a space for an advertisement to the user node. The user node receives the content having a space for an advertisement as well as the advertisement. A user selects the advertisement. Upon selection, the monitor node formats a small data block, known as a "cookie", with the selection information using a sale track program and sends the cookie to the user, and the user is redirected to the transaction node, at which the user may request for transaction. The transaction node provides a transaction confirmation to the user node upon transaction. The transaction confirmation includes a command to record the transaction. In response to the command to record the transaction, the user node provides a request to record the transaction to the monitor node. In addition, the user node provides a query string and the cookie to the monitor node. The monitor node compiles information from the query string and the cookie to update a transaction database.

35 Yet another embodiment of the present invention is a method of tracking transactions over a computer network. The

method includes providing a request to perform a transaction from a user node to a transaction node. The method also includes performing the transaction at the transaction node. The method also includes providing a transaction confirmation, which includes a command to record the transaction. In addition, the method includes providing a request to record the transaction, in response to the command to record the transaction, and recording the transaction at the monitor node.

DESCRIPTION OF THE DRAWINGS

These and other features, aspects, and advantages of the present invention will become better understood with regard to the following description and accompanying drawings wherein:

FIG. 1 is a block diagram of nodes in a transaction tracking network;

FIG. 2 is a sequence diagram illustrating monitoring and recording of transactions initiated by clicking on a creative;

FIG. 3A is a data structure for one embodiment of cookie;

FIG. 3B is a data structure for one embodiment of query string; and

FIG. 3C is a data structure for one embodiment of recorded transaction in a transaction database.

DETAILED DESCRIPTION

In the following embodiments of the present invention, common reference numerals are used to represent the same components. If the features of described embodiments are incorporated into a single system, these components may be shared and perform all the functions of the described embodiments.

FIG. 1 is a block diagram of nodes coupled together in a transaction tracking network in one embodiment according to

the present invention. A user node 100 is coupled to a computer network 101. The computer network 101 may be a global computer network such as, for example, the Internet. As such, the computer network 101 may include many other nodes (e.g., servers, clients, databases, etc.) that are not illustrated in FIG. 1. The user node 100 typically includes a web client, which is used to retrieve information over the computer network. The web client may include web browsers such as, for example, Netscape Communicator or Internet Explorer.

Using the web client, a user at the user node 100 is capable of retrieving information from other nodes on the computer network 101. In one embodiment of the present invention, other nodes on the computer network include a sale (transaction) site 102, a content site 104, an ad server 106 and a creative database 108. Other embodiments of the present invention may include a subset of these nodes. Other embodiments may also include additional nodes. In addition, other embodiments may have one or more nodes coupled to the computer network other than the nodes that comprise the computer network of the present invention. Further, processes running on different nodes may be run at a single node, reducing the number of nodes in the transaction tracking network of the present invention.

The user at the user node 100 may receive a sale site page from the sale site 102. Based on information provided on the sale site page, the user may perform one or more transactions. For example, a transaction may be purchase of goods.

The user at the user node 100 may also receive a content site page from the content site 104. The content site page preferably includes one or more spaces for creatives, e.g., advertisements or transaction creatives. The creatives are

typically provided by the creative database 108. However,
creatives may also be provided by any of the other nodes, such
5 as the sale site 102.

The ad server 106 preferably tracks transactions made by
the user at the user node 100. In other words, the ad server
106 may include a monitor node that monitors and records the
transactions. The ad server 106 in one embodiment of the
10 present invention tracks transactions only after the user
selects a creative associated with the transactions by, for
example, clicking on the creative. In another embodiment of
the present invention, the ad server includes two programs: a
sale track program and a sale log program. The sale track
15 program preferably formats an ad server cookie and stores the
ad server cookie in the user node 100 when the user selects
any of the creatives being monitored. The sale log program
preferably records transactions between the user and the sale
site after the user selects a creative associated with the
20 sale site. The ad server 106 may also report the recorded
transactions to the user node 100, the sale site 102 or to any
other node on the computer network.

Communications between various nodes, e.g., the user node
100 and the sale site 102, on the computer networks, such as
25 the Internet, typically take place using the TCP/IP (Transfer
Control Protocol / Internet Protocol) communications protocols
as the base layer. At higher layer, the communications
typically use HTTP (HyperText Transfer Protocol) and HTML
(HyperText Markup Language). The communications may also use,
30 but are not limited to, UDP (User Datagram Protocol), XML
(Extensible Markup Language) or other SGML (Standard
Generalized Markup Language) formats. A detailed description
of the IP communications protocol is discussed in
Internetworking with TCP/IP, 3rd ed., Douglas Comer, Prentice
35 Hall, 1995, which is fully incorporated herein by reference.

The user typically begins the communication by transmitting a request, e.g., an HTML request, for content to one of the other nodes on the computer network. To initiate the communication, the user typically instructs a web client, e.g., software program such as a web browser, to transmit the request for content. Hereafter for the sake of clarity, the term user will be used to identify the user node as well as the web client on the user node. The request for content is typically in the form of an HTTP request for a URL (Universal Resource Locator).

In response to the request for content, the node receiving the request typically returns the requested content, which typically includes a web page containing HTML code. The node receiving the request may also send a redirection command to redirect the user to one of the other nodes on the computer network. Typical redirection commands include HTML <href> or commands, or an HTTP redirect command containing a fully qualified URL. HTML and HTTP are well known in the art. Comprehensive documentation about HTML, HTTP and related topics are disclosed in *HTML 4.0 Sourcebook*, Ian S. Graham, John Wiley and Sons, Inc., 1998, which is fully incorporated herein by reference.

FIG. 2 is a sequence diagram of a sale tracking operation in an embodiment according to the present invention. At the request 198 of the user 100, the content site 104 provides content in step 200. The content typically includes a web page requested by the user 100, and may include a space for one or more creatives, e.g., advertisements. The creatives may be provided by the content site 104; the creatives, however, preferably are provided by the creative data base 108, as indicated in step 206.

In the embodiment illustrated in FIG. 2, the user provides a request for advertisement 202, to be placed in the

space of the content, to the ad server 106. In other
embodiments, the user 100 may provide a request for
5 advertisement directly to the creative data base 108. For
example, the transaction tracking network of the present
invention also contains certain features, including
requesting, selecting, transmitting, receiving and displaying
of creatives, disclosed in commonly owned U.S. Patent
10 Application No. 09/757,389 filed January 8, 2001 and entitled
"Method and Apparatus for Selecting and Delivering Internet
Based Advertising," the contents of which are fully
incorporated herein by reference.

Referring back to FIG. 2, when the user 100 provides a
15 request for advertisement 202 to the ad server 106, the user
sends a cookie associated with the ad server 106 if one is
available. Cookies are typically written by a web server,
e.g., the ad server 106, on a hard drive of the node that runs
a web client, e.g., the user 100, requesting to the web
20 server. Once a cookie has been created, the web client
typically sends it to the web server that created the cookie
every time the web client requests content from that web
server. A cookie may be overwritten by the web server the
next time the web server that created the cookie is accessed.
25 Each cookie typically has an expiration date, which may be
determined by the web server creating it. Upon reaching the
expiration date, the web client typically erases the cookie
from the hard drive. Use of cookies in client-server
interface is well known to those skilled in the art.

30 Upon receiving the request for advertisement 202 from the
user 100, the ad server 106 preferably provides a request for
creative 204 to the creative database 108. In response, the
creative database 108 in step 206 provides a creative to the
ad server 106. In turn, the ad server 106 in step 208
35 provides the creative to the user 100. The creative received

by the user 100 may be an ad banner or a java script, e.g., multimedia creative, depending on the HTML tag used in the content with space for creative provided by the content site 104. The creative may also be an HTML file.

As long as the user 100 does not select the creative, e.g., by clicking on an ad banner, the user typically does not make any additional requests to the ad server 106. When the user selects the creative in step 210, however, the user is requesting to be redirected to a site associated with the creative. In the embodiment of the present invention illustrated in FIG. 2, the user makes a request to be redirected to the sale site 102. Upon receiving the request for redirection to the sale site 102, the ad server 106 formats an ad server cookie to be written to a hard drive associated with the user. More specifically, the ad server 106 includes a sale track program for tracking user's selection of creatives. The sale track program formats the ad server cookie in step 212. In this embodiment, the sale track program is a CGI (Common Gateway Interface) script. The sale track program may also be written using other software programming/scripting languages such as Perl.

In this embodiment, the ad server cookie is set using a format including the following: Set-Cookie: <sale site code> = <content site code>~<content site category code>|<creative code>|<campaign code>|<cookie ID>|<cookie setting date>|<cookie setting time>|. Each of the fields of the creative typically contains an alphanumeric content comprised of numbers, letters or both. FIG. 3A is a block diagram that shows data structure of an ad server cookie 300 in one embodiment of the present invention. The ad server cookie 300 is associated with a sale site code. The sale site preferably is a destination specified by the tag associated with the

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creative. The sale site code preferably uniquely identifies the sale site.

5 The ad server cookie 300 includes a content site code 302, which is typically associated with the content site 104 that provides the content with space for creative. The ad server cookie may also include a content site category code 304 and a content site subcategory code 306. The content site
10 category code 304 is typically associated with a specific area, such as a particular page, at the content site 104. The content site subcategory code 306 may be associated with a more specific area of the content site 104.

15 A creative code 308 preferably is associated with the creative that has been selected by the user. A campaign code 310 preferably is associated with an advertising campaign during which the creative was viewed and selected. A cookie ID 312 is an identification of the ad server cookie. A cookie setting date 314 signifies the date at which the ad server
20 cookie has been created. A cookie setting time 316 signifies the time at which the ad server cookie has been created. The ad server cookie may optionally include a keyword 318. The keyword 318 may be used to track transactions by keyword when the keyword is provided.

25 Referring back to FIG. 2, the ad server 106 preferably provides the formatted ad server cookie in step 214 to the user 100 to write to the hard drive. The user 100 typically has an option (through setting options in the web browser) not to accept the ad server cookie. If the user refuses to accept
30 the ad server cookie, it is not written to the hard drive, and the ad server typically is unable to continue monitoring and recording transactions beyond this point. If the user accepts the ad server cookie, it is written to the hard drive, and is typically transmitted back to the ad server when the user
35 requests content, e.g., a web page, from the ad server.

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5 When providing the ad server cookie to the user 100, the ad server 106 preferably also transmits a redirection command to the user. The redirection command typically contains a URL to a specific server (or a site) on the computer network. In this embodiment, the redirection command contains the URL of the sale site at which the user may make purchases or perform other transactions such as product and price inquiries.

10 The user 100 provides a request for sale site page in step 216 using the URL provided by the ad server 106. Upon receiving the request for sale site page, the sale site 102 provides the sale site page in step 218 to the user 100. While browsing the sale site page using a web client, the user
15 may provide a request for transaction 220 to perform transactions such as purchases or inquiries. The sale site 102 confirms the transaction by transmitting a transaction confirmation page to the user in step 222.

20 The transaction confirmation page contains HTML tags that calls the ad server 106. For example, in one embodiment of the present invention, the transaction confirmation page includes a tag to request for invisible GIF's, such as 1 x 1 GIF's, from the ad server 106. If the user accepted the ad server cookie earlier, the ad server cookie is provided to the
25 ad server 106 in step 224 along with the request for GIF's.

In addition to the request for GIF's and the ad server cookie, the web client 100 provides a query string to the ad server 106. The query string may be in any format and may include such transaction information as purchased products and
30 purchase prices. FIG. 3B is a data structure for a query string 320 in one embodiment of the present invention. The query string has a format <sale (transaction) site code> |<PAGE>|<SIGNUPS>| <AMOUNT>|<PRODUCT>.

A sale (transaction) site code field 322 includes the
35 identity of the transaction site where the user makes

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transactions. A PAGE field 324 may include any pre-determined information such as time elapsed during transactions. A
5 SIGNUPS field 326 may include any pre-determined information such as type of sale. An AMOUNT field 328 may include any pre-determined information such as purchase price. A PRODUCT field 330 may include any pre-determined information such as purchased product. The length of the query string is
10 typically not limited to the embodiment in FIG. 3B, and other pre-determined fields may be included in the query string data structure 320.

The ad server 106 also includes a sale log program for updating a transaction database using the ad server cookie and
15 the query string. The sale log program checks the ad server cookie to determine if it is associated with the sale (transaction) site 102. If the ad server cookie is associated with the sale site, the sale log program in step 226 updates the transaction database. During this update, the content
20 site 104 is credited with providing initial redirection of the user to the sale site 102. The sale log program may be a CGI script or it may be written in another software programming/scripting language such as Perl.

FIG. 3C is a data structure for transaction information
25 340 in the transaction database. The transaction information 340 includes all data fields from the ad server cookie 300 of FIG. 3A and the query string of FIG. 3B except for the cookie ID field 312 and the keyword field 318. In addition, the transaction information 340 includes a current time field 342
30 and an IP address field 344. The current time field 342 contains the time when the sale log program was called to log the transaction and the IP address field 344 contains the IP address of the user node 100.

The data structure for transaction information 340 is
35 designed to gather transaction information that is valuable to

the interested parties. The transaction information is particularly valuable to the owner of the content site 104 who is credited with transactions made at the sale site 102 subsequently to the initial redirection from the content site 104. The transaction information is also valuable to the advertisers for measuring ad effectiveness and for gathering statistics on such useful information as products browsed, products purchased, purchase amounts and individual spending habits.

For example, by counting the number of users redirected to the sale site 102 and/or the number of transactions made in reference to the creative code and the campaign code, the advertisers, e.g., sale site owners, may quantitatively assess effectiveness of a particular creative or a particular campaign, respectively. The advertisers may also be able to assess effectiveness of placing advertisements in association with a particular content site by analyzing the content site codes logged in the transaction database.

For another example, by comparing the cookie setting time and date against the current time in each of the data structures for transaction information, the advertisers may be able to build a statistical database on such information as average time interval between initial redirection and actual transaction.

The data structures for the ad server cookie 300 in FIG. 3A, the query string 320 in FIG. 3B, and the transaction information 340 in FIG. 3C, are provided for illustrative purposes only. Each of these structures may also contain many other types of information that are valuable to content site owners, advertisers, e.g., sale site owners, and other interested parties, such as the ad server provider. For example, one or more of the three data structures may include

a field that contain user-provided information such as age, gender or location of the user.

5 Referring back to FIG. 2, the steps of the sale monitoring and recording operation sequence do not necessarily take place in one continuous transaction sequence. Instead, there may be a gap of hours, days, or even weeks between two adjacent steps. For example, the user 100 may be redirected
10 to the sale site in step 214, requests the sale site page in step 216 and be provided the sale site page in step 218, in one continuous transaction sequence. However, the user may or may not request transaction in step 220 immediately thereafter.

15 The user may view the sale site page provided in step 218, but may choose not to proceed with providing a request for transaction as in step 220 at that time. The user may choose to leave the sale site and may even choose to exit the web client altogether. Then the user may choose to request
20 the sale site page at a later time, after a period of hours, days, or even weeks. At this later time, the user may request to be redirected to the sale site by clicking on the creative as in step 208. The user may also request the sale site page simply by entering the URL for the sale site into an address
25 command window of a web client, e.g., Address Bar of Internet Explorer or Location Toolbar of Netscape Communicator.

In the described embodiments of the present invention, once the user is initially redirected to the sale site through clicking on the creative, any subsequent transaction the user
30 makes at the sale site is tracked by the sale log program and entered in the transaction data base, regardless of the method by which user subsequently enters the sale site to make the transaction and regardless of the time interval between the initial redirection and the subsequent transaction. This
35 logging of every transaction continues because the ad server

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cookie, which prompts the sale log program to update the transaction database, is provided to the ad server upon
5 confirmation of each transaction.

The ad server cookie in the content site code field 302 contains information on the content site through which the user is initially redirected to the transaction site. Therefore, as long as the ad server cookie remains in the hard
10 drive of the user, the content site information is provided to the ad server, as in step 224, upon confirmation of transaction as in step 222. Consequently, the content site is credited with the transaction whenever the sale log program updates the transaction database as in step 226.

15 Accordingly, the present invention provides a method and apparatus for tracking transactions over a computer network, such as the Internet. Although this invention has been described in certain specific embodiments, many additional modifications and variations would be apparent to those
20 skilled in the art. It is therefore to be understood that this invention may be practiced otherwise than as specifically described. Thus, the present embodiments of the invention should be considered in all respects as illustrative and not restrictive, the scope of the invention to be determined by
25 the appended claims and their equivalents rather than the foregoing description.

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